

Remarks

Entry of the above-noted amendments, reconsideration of the application, and allowance of all claims pending are respectfully requested. By this amendment, claims 1-2, 10-11, and 18-19 are amended and claims 20-25 are added. These amendments to the claims constitute a bona fide attempt by applicants to advance prosecution of the application and obtain allowance of certain claims, and are in no way meant to acquiesce to the substance of the rejections. Support for the amendments can be found throughout the specification (e.g., paragraphs 7-10, and 19-21), figures, and claims and thus, no new matter has been added. Claims 1-25 are pending.

Allowable Subject Matter:

Claims 12-17 are allowed. Applicants gratefully acknowledge this indication of allowance.

Claims 2-11 and 19 were objected to as being dependent upon rejected base claims, respectively, 1 and 18, but were indicated as allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants gratefully acknowledge this indication of allowability, and have rewritten claims 2-11 and 19 in independent form including all of the limitations of the base claim and any intervening claims (there were none).

Drawing Objections

The Office Action (enumerated paragraph 1, page 2) states:

Drawing Amendments

Kindly substitute the replacement drawing sheets 2-3 presented herewith for the prior drawing sheets 2-3.

On replacement drawing sheets 2-3, the prior arrow towards element 92 in the feedback loop 94 has been removed.

Approval and entry of the replacement drawing sheets 2-3 are respectfully requested.

The drawings are objected to because in figures 2 and 3, the feedback loop 94 connects element 92 to element 54, wherein the specification describes information being sent from element 92 to element 54. However, there is an arrow towards element 92 as well as towards element 54. The arrow towards element 92 is incorrect and should be removed, because the specification does not describe information being transmitted from element 54 to element 92. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application.

On replacement drawing sheets 2-3 presented herewith, the prior arrow towards element 92 in the feedback loop 94 has been removed.

Withdrawal of the objection to the drawings is therefore respectfully requested.

Claim Rejections - 35 U.S.C. § 103

Claims 1 and 18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Gu (U.S. Patent Application Publication 2003/0072393) in view of Betts et al. (U.S. Patent No. 5,396,519; "Betts"). This rejection is respectfully, but most strenuously, traversed.

Applicants respectfully submit that the Office Action's citations to the applied references, with or without modification or combination, assuming, *arguendo*, that the modification or combination of the Office Action's citations to the applied references is proper, do not teach or suggest one or more elements of the claimed invention, as further discussed below.

For explanatory purposes, applicants discuss herein one or more differences between the Office Action's citations to the applied references and the claimed invention with reference to one or more parts of the applied references. This discussion, however, is in no way meant to acquiesce in any characterization that one or more parts of the Office Action's citations to the applied references correspond to the claimed invention.

CLAIM 1 AND CORRESPONDING DEPENDENT CLAIMS

Applicants respectfully submit that the Office Action's citations to the applied references do not teach or suggest one or more elements of the claimed invention. A careful reading of the Office Action's citations to the applied references fails to teach or suggest, for example, that the feedforward cancellation loop includes the secondary A/D converter for generating the digital cancellation signal based on the IF multi-carrier signal and the level adjustment circuit coupled to the secondary A/D converter for digitally adjusting the digital cancellation signal such that carriers in the digital cancellation signal correspond to carriers in the IF multi-carrier signal having power levels above the predetermined threshold, as recited in applicants' independent claim 1.

Gu discloses a signal-balancing system and technique for a quadrature transceiver essentially free of adverse circuitry mismatch effects. Gu discloses (enumerated paragraph 52):

As will be discussed in detail below, the down-conversion mixers 300, 310 may also create adjacent signal inside the image frequency of the wanted signal. In this case, an analog image reduction complex filter 320 may be configured to suppress any strong adjacent signal found inside the image frequency band of the wanted signal. In some applications, adjacent channel signal level may be substantially higher than the wanted signal, for example, 20 dB higher. Accordingly, in one embodiment, a complex filter 320 may be designed to suppress negative frequency components. In a particular embodiment, the complex filter 320 may be an active poly-phase filter designed to suppress only negative frequency components. In another embodiment, passive poly-phase filters may be used to suppress only negative frequency signal. In a further embodiment, the analog complex filter 320 is configured to substantially reject negative or positive frequency components of down-converted baseband signal (e.g., in a low-IF scheme). In another further embodiment, the analog complex filter 320 is configured to provide no rejection of frequency components of down-converted baseband signal (e.g., in a direct conversion scheme).

Simply missing from the Office Action's citation to Gu is any mention that the feedforward cancellation loop includes the secondary A/D converter for generating the digital cancellation signal based on the IF multi-carrier signal and the level adjustment circuit coupled to the secondary A/D converter for digitally adjusting the digital cancellation signal such that carriers in the digital cancellation signal correspond to carriers in the IF multi-carrier signal having power levels above the predetermined threshold, as recited in applicants' independent claim 1.

So, the Office Action's citation to Gu fails to satisfy at least one of the limitations recited in applicants' independent claim 1.

The shortcomings of the Office Action's citation to Gu relative to certain elements of the claimed invention have been discussed above. The Office Action proposes a combination of the citation to Gu with a citation to Betts. However, the Office Action's citation to Betts does not overcome the deficiency of the Office Action's citation to Gu. Applicants respectfully submit that the proposed combination of the Office Action's citation to Gu with the Office Action's citation to Betts fails to provide the required configuration, assuming, *arguendo*, that the combination of the Office Action's citation to Gu with the Office Action's citation to Betts is proper.

Betts (column 6, lines 58-68) discloses a noise whitening filter:

The signal then passes into noise whitening filter 102. Noise whitening filter 102 compensates for colored noise that is introduced by the communication channel. It is desirable to have white noise so that the trellis code can be successfully decoded. Noise whitening filter 102 comprises three-tap FIR filter 104 and summer 106. FIR filter 104 is well known in the industry and has the same tap values as FIR filter 66 in the remote transmitter of FIG. 3

Simply missing from the Office Action's citation to Betts is any mention that the feedforward cancellation loop includes the secondary A/D converter for generating the digital cancellation signal based on the IF multi-carrier signal and the level adjustment circuit coupled to the secondary A/D converter for digitally adjusting the digital cancellation signal such that carriers in the digital cancellation signal correspond to carriers in the IF multi-carrier signal having power levels above the predetermined threshold, as recited in applicants' independent claim 1.

So, the Office Action's citation to Betts fails to satisfy at least one of the limitations recited in applicants' independent claim 1.

The Office Action's citations to Gu and Betts both fail to meet at least one of applicants' claimed features. For example, there is no teaching or suggestion in the Office Action's citations to Gu or Betts that the feedforward cancellation loop includes the secondary A/D converter for generating the digital cancellation signal based on the IF multi-carrier signal and the level adjustment circuit coupled to the secondary A/D converter for digitally adjusting the digital cancellation signal such that carriers in the digital cancellation signal correspond to carriers in the IF multi-carrier signal having power levels above the predetermined threshold, as recited in applicants' independent claim 1.

For all the reasons presented above with reference to claim 1, claim 1 is believed neither anticipated nor obvious over the art of record. The corresponding dependent claims are believed allowable for the same reasons as independent claim 1, as well as for their own additional characterizations.

CLAIM 18

Applicants respectfully submit that the Office Action's citations to the applied references do not teach or suggest one or more elements of the claimed invention. A careful reading of the Office Action's citations to the applied references fails to teach or suggest, for example, generating the digital cancellation signal based on the IF multi-carrier signal and digitally adjusting the digital cancellation signal such that carriers in the digital cancellation signal correspond to carriers in the IF multi-carrier signal having power levels above the predetermined threshold, as recited in applicants' independent claim 18.

Gu discloses (enumerated paragraph 52):

As will be discussed in detail below, the down-conversion mixers 300, 310 may also create adjacent signal inside the image frequency of the wanted signal. In this case, an analog image reduction complex filter 320 may be configured to suppress any strong adjacent signal found inside the image frequency band of the wanted signal. In some applications, adjacent channel signal level may be substantially higher than the wanted signal, for example, 20 dB higher. Accordingly, in one embodiment, a complex filter 320 may be designed to suppress negative frequency components. In a particular embodiment, the complex filter 320 may be an active poly-phase filter designed to suppress only negative frequency components. In another embodiment, passive poly-phase filters may be used to suppress only negative frequency signal. In a further embodiment, the analog complex filter 320 is configured to substantially reject negative or positive frequency components of down-converted baseband signal (e.g., in a low-IF scheme). In another further embodiment, the analog complex filter 320 is configured to provide no rejection of frequency components of down-converted baseband signal (e.g., in a direct conversion scheme).

Simply missing from the Office Action's citation to Gu is any mention of generating the digital cancellation signal based on the IF multi-carrier signal and digitally adjusting the digital cancellation signal such that carriers in the digital cancellation signal correspond to carriers in

the IF multi-carrier signal having power levels above the predetermined threshold, as recited in applicants' independent claim 18.

So, the Office Action's citation to Gu fails to satisfy at least one of the limitations recited in applicants' independent claim 18.

The shortcomings of the Office Action's citation to Gu relative to certain elements of the claimed invention have been discussed above. The Office Action proposes a combination of the citation to Gu with a citation to Betts. However, the Office Action's citation to Betts does not overcome the deficiency of the Office Action's citation to Gu. Applicants respectfully submit that the proposed combination of the Office Action's citation to Gu with the Office Action's citation to Betts fails to provide the required approach, assuming, *arguendo*, that the combination of the Office Action's citation to Gu with the Office Action's citation to Betts is proper.

Betts (column 6, lines 58-68) discloses a noise whitening filter:

The signal then passes into noise whitening filter 102. Noise whitening filter 102 compensates for colored noise that is introduced by the communication channel. It is desirable to have white noise so that the trellis code can be successfully decoded. Noise whitening filter 102 comprises three-tap FIR filter 104 and summer 106. FIR filter 104 is well known in the industry and has the same tap values as FIR filter 66 in the remote transmitter of FIG. 3

Simply missing from the Office Action's citation to Betts is any mention of generating the digital cancellation signal based on the IF multi-carrier signal and digitally adjusting the digital cancellation signal such that carriers in the digital cancellation signal correspond to carriers in the IF multi-carrier signal having power levels above the predetermined threshold, as recited in applicants' independent claim 18.

So, the Office Action's citation to Betts fails to satisfy at least one of the limitations recited in applicants' independent claim 18.

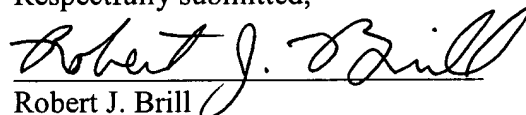
The Office Action's citations to Gu and Bett both fail to meet at least one of applicants' claimed features. For example, there is no teaching or suggestion in the Office Action's citations to Gu or Betts of generating the digital cancellation signal based on the IF multi-carrier signal and digitally adjusting the digital cancellation signal such that carriers in the digital cancellation signal correspond to carriers in the IF multi-carrier signal having power levels above the predetermined threshold, as recited in applicants' independent claim 18.

For all the reasons presented above with reference to claim 18, claim 18 is believed neither anticipated nor obvious over the art of record.

Withdrawal of the §103 rejection is therefore respectfully requested.

In view of the above amendments and remarks, allowance of all claims pending is respectfully requested. If a telephone conference would be of assistance in advancing the prosecution of this application, the Examiner is invited to call applicants' attorney.

Respectfully submitted,



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